FIRE APPARATUS AXLE WEIGHT EXEMPTION
PROPOSED TEXT OF REGULATION

CALIFORNIA CODE OF REGULATIONS

TITLE 21. Public Works

Division 2. Department of Transportation

Chapter 7. Transportation Permits

§1411.7. Fire ~~Trucks~~ Apparatus

(a) "Fire Apparatus" is defined, for the purposes of these regulations, as a vehicle designed to be used under emergency conditions to transport personnel and equipment, or to support the suppression of fires or mitigation of other hazardous situations. This definition is based on the *NFPA* [National Fire Protection Association] *1901 Standard for Automotive Fire Apparatus 2009 Edition*. This definition shall not include haul equipment.

Fire apparatus shall be built to the Federal Motor Vehicle Safety Standard (FMVSS) and NFPA 1901 Standard in effect at the time of manufacture.

(b) Any fire ~~truck~~ apparatus may exceed the maximum allowable ~~axle~~ weights of the Department's Transportation Permit Program, but shall not exceed the following axle weight limits:

Axle Configuration Max. allowable weight

Single steering axle (front and rear) ~~23,000~~ 24,000 pounds
~~Single Tiller axle 24,000 pounds~~
Single drive axle ~~24,000~~ 31,000 pounds
Tandem axles 48,000 pounds
Tandem rear drive steer axles 48,000 pounds
Tridem axles 54,000 pounds

~~(b) Notwithstanding the weight limits set forth in (a) above:~~

~~1) A two-axle aerial ladder fire truck and a two-axle aerial water tower fire truck shall not exceed 31,000 pounds on the rear axle. A three-axle aerial platform ladder fire truck shall not exceed 53,000 pounds on the tandem axle assembly. An aerial ladder fire truck, two-vehicle combination, shall not exceed 27,000 pounds on the single-drive axle of the power unit.~~

~~2) A pumper fire truck designed to carry a minimum capacity of 1,200 gallons shall not exceed 27,000 pounds on a single drive axle.~~

(c) ~~A~~ Ffire ~~truck~~ apparatus designed to carry a minimum capacity of 1,200 gallons and exceed axle weights authorized in California Vehicle Code Section 35551 or Section 35551.5~~,~~ shall be permanently marked on the manufacturer's GVW rating plate with the gallonage the fire ~~truck~~ apparatus is designed to carry.

(d) Tandem axles shall have a minimum axle spacing of 4 feet and tridem axles shall have a minimum axle spacing of 9 feet as measured from the centerline of the first axle to the centerline of the last axle in the axle group. Tandem axle spacing shall not exceed 8 feet and tridem axles shall not exceed 10 feet as measured from the centerline of the first axle to the centerline of the last axle in the axle group.

Except for front ~~steer~~ and rear ~~tiller~~ steer axles, all axles within the same loading group shall have a common suspension system that naturally divides weight between all axles in the suspension group equally and equitably, both statically and dynamically under all loading conditions without any influence from an outside source.

(e) All fire ~~truck~~ apparatus axles shall have a minimum of 4 tires per axle, except for front ~~steer~~ and ~~tiller~~ rear steer axles. Four-tired axles may be equipped with super single tires with a minimum of 18 inches (445 mm) of cross section and 19.5 inches of bead diameter. When super singles are used on a single axle application, the maximum weight on that axle shall be limited to ~~23,000~~ 24,000 pounds. The tires must have a rated capacity marked on the sidewall of the tire as required by the U.S. Department of Transportation, Standard FMVSS 119. The sum of the rated capacities of the tires on the axle shall equal or exceed the axle weight. ~~The tire shall be of sufficient tire size so as not to exceed 685 pounds per inch of nominal tire width on front steering and tiller axles and not to exceed 625 pounds per inch of nominal tire width on all other axles. For purposes of this regulation, "nominal tire width" is the width of tire actually marked on the sidewall of the tire~~.

(f) Fire ~~truck~~ apparatus axle weights shall not exceed the axle manufacturer's rated axle capacity when the axles are equipped with axle components of a corresponding rating.

(g) Fire ~~trucks~~ apparatus may exceed width limitations provided in Division 15 of the California Vehicle Code but cannot exceed 120 inches. All fire ~~trucks~~ apparatus shall comply with the length, height, and overhang limitations of Division 15 of the Vehicle Code except that single-unit fire apparatus may have a maximum length of 52 feet provided that they travel on roads that can accommodate them, and fire ~~trucks~~ apparatus defined in sections 1411.1(d), (e) and (f) may have a maximum front overhang of 8 feet from the front bumper provided that the driver's vision to the left and right is not impaired by the projecting or supporting structure. A fire apparatus vehicle with two parts coupled together at an articulation point is defined in this regulation as a "combination of vehicles," regardless of whether the parts detach, and therefore must comply with the length limits for a combination of vehicles in Vehicle Code Section 35401 (a).

(h) Fire ~~trucks~~ apparatus meeting the requirements of this regulation may operate on State and local ~~highways~~ roadways without a transportation permit. Fire trucks that exceed the weight requirements of this regulation for tandem or tridem axles may receive transportation permits from the Department to operate on State routes and from local governments to operate on local roads. The permit shall not allow any increase in single axle weights. The permit shall limit tandem and tridem weights to no more than 15% over the weights allowed in these regulations. The permit shall allow bridge access only on bridges with a capacity rating that is adequate for the additional axle weights.

(i) Nothing in this Section shall preempt the requirements of Vehicle Code Section 35002(d) and Section 35002(e).

(j) Fire ~~trucks~~ apparatus exempted from provisions in Division 15 of the Vehicle Code shall comply with California Vehicle Code Section 24011.

(k) ~~Fire truck weights shall not exceed the maximum weight limits posted for any bridge.~~ Fire apparatus may not travel on a bridge where the weight of the fire apparatus exceeds the posted maximum bridge weight.

(l) All fire ~~trucks~~ apparatus shall comply with the Vehicle Code Chapter 3, Brakes, commencing with Section 26301. In addition, fire ~~trucks~~ apparatus that exceed the axle weight limits of 22,500 pounds on a single axle ~~of~~ or 34,000 pounds on a tandem axle assembly, or where the gross vehicle weight exceeds statutory weight limits, shall be equipped with a brake system designed to enhance vehicle control and stability during adverse weather conditions and emergency stops. Each type of fire ~~truck~~ apparatus that exceeds the axle weight limits of 22,500 pounds on a single axle or 34,000 pounds on a tandem axle assembly, or where the gross vehicle weight exceeds statutory weight limits, prior to sales in California, shall be tested for compliance with the following Performance Tests:

1) Performance Tests

A vehicle with a brake system that is designed to enhance vehicle control and stability shall be tested for the following "Dry Road, Straight Line Stops" and "Slippery Road, Curved Stops" under the control of the General Test Conditions:

a) General Test Conditions

The following test conditions are applicable to both the "Dry Road, Straight Line Stops" and the "Slippery Road, Curved Stop" test:

- Level 12-foot width lane;
- Vehicle shall be centered in the lane at the initiation of braking;
- Test driver shall be allowed to steer as necessary during braking;
- Brake shall be fully applied as rapidly as possible;
- Initial brake temperature shall not exceed 250 degrees F (in lining) at the hottest brake, as measured by brake thermocouple installed in accordance with SAE J843;
- The transmission shall be in the neutral position or the clutch depressed;
- Test vehicle shall be tested both empty as delivered to the Fire District without the miscellaneous equipment installed by the Fire District, and loaded to the maximum gross vehicle weight rating. Vehicles equipped with tanks for liquid fire retardants shall be tested with tanks 2/3 filled with liquid.
- Surface Friction - Peak Friction Coefficient (PFC) as determined with an ASTM E 1134 tire on ASTM traction trailer using ASTM E 1337 procedure. Average value of 10 runs spaced evenly over the test surface.
- Brake Burnish - Burnish brakes as per FMVSS 121 burnish procedure prior to testing (i.e., 500 snubs from 40 to 20 mph at 10 fpsps on a 1.0 mile interval.
- The brakes shall be adjusted within the manufacturer's recommended tolerances;

- The tires shall be inflated to the manufacturer's recommended pressure for the load of the tire.

b) Dry Road, Straight Line Stops

The fire ~~truck~~ apparatus shall enter the test lane described in the General Test Conditions with the surface friction and initial speed shown below. Thereafter, the brakes shall be applied as required in the General Test Conditions:

- Surface friction level-PFC=0.9 (Most dry asphalt and concrete surfaces are at this level);
- 60 mph initial speed;
- 3 repeat runs.

c) Slippery Road, Curved Stops

The fire ~~truck~~ apparatus shall enter the test lane described in the General Test Conditions at the surface friction, radius, and initial speed shown below. Thereafter, the brakes shall be applied as required in the General Test Conditions:

- Surface friction level-PFC=0.5 (wet, sealed asphalt in good condition is usually at or below this level);
- 500-foot curve radius (lane centerline);
- Initial speed to be the lower of~~:~~ 30 mph (48 km/h) or 75% of the maximum drive through speed. Drive through speed is the highest speed that the vehicle can be driven through 200 feet (60.8 meter) of the 500-foot radius curve without leaving the lane. The vehicle is to be centered in the lane at the initiation of the drive through test;
- 3 repeat runs.

2~~.~~) Fail-Safe Protection and Failure Warning

In the event of an electrical failure in the system installed to enhance the vehicle stability and control, the performance of the basic foundation brakes shall be unaffected. The vehicle shall be equipped so that when the left front, right front, left rear, or right rear brake assembly of the enhanced system fails to function as designed, the operator can tell without the need to connect external test equipment. Upon failure of the system, an amber light(s) shall illuminate on the instrument panel of the vehicle. The system installed to enhance the stability and control shall continue to operate without malfunction when electrical current to the stop light circuit fails.

3) Test Results

The final stage manufacturers shall test each type of fire ~~truck~~ apparatus and show compliance with (l)(1)(b) and (l)(1)(c) when tested under the General Test Conditions of (l)(1)(a) above. Each type of fire ~~truck~~ apparatus shall be capable of making a full emergency stop in both the Straight Line Stop and the Curved Stop without any portion of the fire ~~truck~~ apparatus leaving the test lane. The test report shall be written in simple terms, and shall include Performance Test results in (l)(1)(b) and (l)(1)(c). The final stage manufacturers shall make the test report available upon written request from State, city, or county officials.

(m) Manufacturer's Certification.

Each fire ~~truck~~ apparatus equipped with a system to enhance stability and control shall be certified by the final stage manufacturer that the additional brake enhancing system is installed and functional.

(n) This section shall ~~be effective and~~ apply to ~~vehicles purchased on or after January 1, 1994~~ all fire apparatus, except that the braking system and performance test requirements in (l) shall apply to vehicles purchased on or after January 1, 1994.

AUTHORITY:

Note: Authority cited: Sections 35002 and 35795, Vehicle Code. Reference: Sections 35002 and 35780, Vehicle Code.

HISTORY:

1. New section filed 8-23-93; operative 9-22-93 (Register 93, No. 35).